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To predict a person's use of his Manpower Development and Training Act (MDTA) training, this study attempted to supplement existing methods of evaluation, using personal descriptive data about trainees and General Aptitude Test Battery Scores. The sample under study included all students enrolled in ten MDTA projects, representing a geographical cross section of Minnesota, training to be technicians, sales and clerical workers, and skilled workers. Data revealed many significant implications: student confidence and skills increased after training; a relatively large number dropped out of the technician and skilled programs; and a large number remained unemployed after the sales and clerical training. Employment counselors need to be aware of personal characteristics which lead to success, and training should concentrate on work related attitudes. Attitudes and skill together are the best predictor of success, but more research should be done to validate these results with a larger study and to identify ways of improving attitudes during training. (A few references, the teacher evaluation of students, and tables of students' personal data are given.) (jf)

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MDTA

VARIABLES RELATED TO MDTA TRAINEE EMPLOYMENT SUCCESS IN MINNESOTA

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David J. Pucel
Principal Investigator
February, 1968

Variables Related to MDTA Trainee

Employment Success in Minnesota

I. The Problem

Since the passage of the Manpower Development and Training Act of 1962, the local Employment Security offices have been charged with selecting persons to enroll in the various MDTA training programs. This selection responsibility is an enormous task considering the number of persons to be trained and the large number of possible selection criteria. In 1963, the first year of operation, training programs were nationally established for more than 500 different occupations to train 103,000 trainees. (4, p.5) In 1965, the number of different occupations trained for increased to more than 600 and the number of trainees increased to 152,000. (3, p.5) Since the passage of the Act until September, 1967, approximately 10,000 persons have graduated from Minnesota's MDTA program alone. (2)

Over the years, the Employment Service has developed a variety of tools for matching workers and jobs which are used as selection and guidance aids. Some of these are interviewing techniques, counseling procedures, and test batteries, such as the General Aptitude Test Battery (GATB) and the Specific Aptitude Test Batteries (SATB). Although these techniques have been useful in the past for selection and guidance, a need exists for more refined methods of appraising the potential of prospective MDTA trainees.* This may not mean, however, that new data need be gathered. The employment service currently gathers large quantities of information on each of the persons enrolled in MDTA training. An examination of the relationship of the information currently being gathered to post-training employment might show that new methods of interpreting current data are needed and not new data.

Another problem facing persons concerned with MDTA training is the emphasis to be placed upon various aspects of the training program. Most persons responsible for training agree that skill development is extremely important. There is less agreement upon the responsibility of MDTA programs to make an overt attempt to build desirable work related attitudes rather than to assume they accompany skill development.

We are becoming more and more aware that it is not enough to develop occupational skill, we must also develop occupational attitudes.

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*A review of many current research projects pertaining to MDTA problems can be found in summary publications from the United States Department of Labor, Manpower Administration. For this reason a review has not been presented in this report. (See bibliography)

However, there is little empirical evidence to support the contention that attitudes truly affect success on the job. There is even less evidence to show that attitudes are important in relation to job success after they have been adjusted for skill acquisition.

This study was conducted to determine if descriptive data about trainees currently being gathered by the employment service such as personal information and General Aptitude Test Battery scores are effective predictors of success in MDTA programs. An attempt was also made at isolating (1) attitudes and (2) skill development during the training program which might be related to success in the occupation.

II. Objectives

The major objectives of the study were:

A. To determine which combination of personal information and General Aptitude Test Battery Scores most efficiently predicts whether a trainee will:

(a) drop out of training

(b) complete training and become unemployed

(c) complete training and become employed in an occupation unrelated to training or

(d) complete training and become employed in an occupation related to training

and to determine the relationships among those predictors.

B. To determine which combination of teacher ratings of attitudes and achievement can most efficiently predict (a), (b), (c) and (d) above and to determine the relationships among those predictors.

III. Method

A. Population and Sample

The sample used in this study was all of the students enrolled in ten MDTA projects purposively selected from a population of 104 MDTA projects funded and in operation in Minnesota as of August 18, 1966, on whom there were complete data. The ten projects were selected on the basis of the following three criteria:

1. The projects had to terminate between December 16, 1966 and February 17, 1967.

2. At least three of the projects selected had to fall into each of the following three occupational classifications, using Dictionary of Occupational Titles:

a. technician group

b. sales and clerical group

c. skilled group

3. The projects selected had to represent a geographical cross-section of the State of Minnesota.

Table I summarizes the ten projects sampled and the number of trainees enrolled in each. Also indicated are the number on individuals on whom complete sets of data were available. Incomplete data on an individual resulted from incomplete employment service data.

Table I

Study Sample

MDTA Project Number	Occupation training for	Project Location	Number of trainees enrolled	Number of comp. sets of data
Technician Group				
(M)5014-121	Chemical Tech.	Mpls.	20	
(M)5014-053	Dental Asst.	Hibbing	12	
(M)6003-028	Draftsman, Mech.	St. Paul	15	
(R)6016	Draftsman, Mech.	Albert Lee	18	
		Sub-total	65	45
Sales and Clerical Group				
(M)6003-012	Clerk, Gen. Off.	Faribault	21	
(M)6003-033	Clerk, Gen. Occ.	Granite Falls	23	
(M)5040-026	Sales, Auto Parts (Farm Implement)	Austin	19	
		Sub-total	63	45
Skilled Group				
(M)6003-066	Diesel Mech.	Alexandria	21	
(M)6003-010	Elec. Mech.	Moorhead	20	
(XM)	Welder, Comb.	Mpls.	23	
		Sub-total	64	48
		Overall total	192	138

B. Data Gathered

Data gathered on each of the persons in the sample were classified into three broad categories: (1) personal and training related characteristics (2) in-school instructor ratings of attitudes and achievement (3) post-training employment (success criteria) data.

Data categories one and two above represent two different sets of independent variables which were each used to independently predict the criterion or post-training employment status.

1. Personal and Training Related Characteristics.

VARIABLE NAME	VARIABLE NUMBER
a. Age (years)	X_1
b. Sex	X_2
c. Handicapped (yes, no)	X_3
d. Prior Military Status (yes, no)	X_4
e. Marital Status (single-divorced, married-separated)	X_5
f. Primary Wage Earner (yes, no)	X_6
g. Number of Dependents	X_7
h. Primary Occupation (related to training, unrelated to training)	X_8
i. Mobile (yes, no)	X_9
j. Employment Status (underemployed, unemployed, re-entrant to labor force)	X_{10}
k. Years of Education	X_{11}
l. High School Curriculum (general education, college preparatory, vocational-related, vocational-unrelated)	X_{12}
m. Other Training (college-related, college-unrelated, vocational-related, vocational-unrelated)	X_{13}
n. Employment Record (mos. related employment, mos. unrelated employment)	X_{14}
o. Type of Work Desired by Applicant	X_{15}
GATB Scores	
p. G - Intelligence	X_{16}
q. V - Verbal Aptitude	X_{17}
r. N - Numerical Aptitude	X_{18}

s. S - Spatial Aptitude X_{19}

t. Q - Clerical Perception X_{20}

Information Gathered For Descriptive Purposes Only

u. Reasons for Termination of Training After Selection (achieved training objective, obtained employment, illness, insufficient funds, personal problems, undertook full-time training other than MDTA, failed to enroll) X_{21}

v. Training Allowances X_{22}

2. In-school Instructor Ratings of Attitudes and Achievement

VARIABLE NAME	VARIABLE NUMBER
a. Initiative and Ambition	Z_1
b. Quality Conscious	Z_2
c. Cooperative with Students	Z_3
d. Response to Criticism	Z_4
e. Discipline	Z_5
f. Effort	Z_6
g. Skill When Left	Z_7
h. Technical Information When Left	Z_8
i. Confidence When Left	Z_9
j. Confidence When Began	Z_{10}
k. Skill When Began	Z_{11}
l. Tech. Information When Began	Z_{12}
m. Attendance	Z_{13}
n. Achievement Compared to Class During Program	Z_{14}
o. Preparation in Basic Learning Skills	Z_{15}

3. Post-Training Employment Data (Success Criteria)

a. Dropped Before Completing Program Y_1

b. Completed and Unemployed Y_2

c. Completed and Employed in an Occupation Unrelated to Training Y_3

d. Completed and Employed in an Occupation Related to Training Y_4

C. Data Collection

The data were gathered with the assistance of Minnesota State Department of Employment Security (MSES) personnel, and the administrators and instructors of the ten MDTA projects in the sample from the following sources:

1. Employment Service Data

   a. The Manpower Utilization Section of the Minnesota Department of Employment Security provided information from its file of MT-101 (Characteristics of Trainee), MT-102 (Individual Trainee Termination Training or Services) and MT-103 (Post Training Report) forms. The information provided comprised variables X_1 - X_{10}, X_{21}, X_{22} and Y_1 - Y_4.

   b. The local employment service offices of Minnesota summarized information from MSES form 511 (Employment Service Application) and ES form 580 (Training Control Record) cards. The information provided comprised variables X_{11} - $_{20}$.

2. The instructors of each of the ten MDTA projects in the sample filled out a rating scale for each of the trainees in their classes after the classes were ended. The data were summarized into variables Z_1 - Z_{15}. (See Appendix A for a copy of the rating scale.)

D. Development of the Rating Scale

In order to gather information about student attitudes and achievement during the MDTA programs, a rating scale to be completed by teachers was developed (Appendix A). Persons on the staff of the Department of Industrial Education at the University of Minnesota were interviewed by the investigator. A five point rating scale was designed to assess each of the attitudes and basic facets of achievement which the interviewees indicated were important considerations in a training program. The first, third, and fifth possible ratings on each of the scales were defined in behavioral terms in an attempt to aid raters in using the instrument.

After the instrument was tentatively developed it was reviewed by personnel from the Minnesota State Department of Vocational Education and the Minnesota State Department of Employment Security. Suggestions from these agencies were incorporated into the final instrument.

E. Analysis

The analysis of the data was performed using the computer facilities of the Computer Center at the University of Minnesota. Computer program UMST 600 was used to compute the following types of descriptive information on each of the X, Y and Z variables for each of the three sample groups (technician, sales and clerical, and skilled): (a) the frequency falling into each interval or category per variable and (b) the percentage falling into each interval or category per variable. Computer program UMSTAT 68 was used in selecting those combinations of independent variables which most efficiently predicted the criterion through step-wise linear regression, eliminating those variables, one at a time, that accounted for the least amount of criterion variance. Computer program UMST 500 was used to see how well common or composite equations developed by purposively constructing equations from variables which predicted "well" in each of the three samples did actually predict the criterion for each individual sample.

As indicated earlier the criterion for success used in developing all of the prediction equations for this study was post-training employment. The success criterion was composed of four categories assumed to be ordered in the following sequence from less desirable to more desirable: (1) dropped out before completing training, (2) completed training and unemployed, (3) completed training and employed in an occupation unrelated to training and (4) completed training and employed in an occupation related to training. Equations were developed for each sample separately and composite equations were developed which predicted relatively well within any of the three samples. Two separate sets of equations were developed. One set was developed using the personal and training related characteristic variables (variables X_1 - X_{20}) and another set was developed using the in-school instructor ratings of attitudes and achievement (variables Z_1 - Z_{15}).

IV. Findings

A. Descriptive Findings

The results of the analysis of the sample descriptive information indicated that insufficient data were available on the P, K, F, and M scales of the GATB. Relatively few potential trainees were administered those portions of the GATB and, therefore, they were eliminated from further analysis.

1. Descriptive Findings Concerning the Personal and Training Related Characteristics.

Tables summarizing descriptive data on each of the personal and training related variables for each sample as well as all of the samples combined can be found in Appendix B. The information reported below is based upon a summary of the data obtained for all of the samples combined. Almost all trainees responded with complete data on the following variables. Where the discrepancy from N = 192 is large the actual numbers are indicated on the tables.

Of the 192 applicants accepted for training in the sample MDTA programs:

X_1 29% of the students were under 22 years of age, 51% were between 22 and 34 years of age and 20% over 35.

X_2 59% of the students were male and 41% were female.

X_3 16% of the students were handicapped.

X_4 10% had prior military experience.

X_5 40% of the students were married or separated while 60% were single or divorced.

X_6 79% of the students were primary wage earners.

X_7 20% had no dependents, 40% had one dependent and 40% had more than one dependent.

X_8 69% indicated that they previously worked primarily in an occupation related to the training program they entered.

X_9 67% of the students indicated they would be willing to move out of the area to become employed after training.

X_{10} At entry into training 29% of the students were underemployed, 69% were unemployed and 2% were re-entrants to the labor force.

X_{11} 6% of the students had at least 8 years of education, 21% had between 9 and 11 years and 73% had 12 or more years of education.

X_{12} 88% of the trainees had taken a general education curriculum while in high school, 10% took college preparatory and 2% took a vocational curriculum.

X_{13} 88% of the students had less than 6 months of formal educational training beyond high school. 67% of those that did have training beyond high school had vocational training unrelated to the MDTA program they were in.

X_{14} 91% of the students had not had any work experience directly related to the occupation they were training for and 3% had between one month and one year. Only 9% had no unrelated work experience and 26% had less than one year. 66% had at least one year of unrelated work experience.

X_{15} 81% entered a training program related to the occupation they indicated they would like to enter when applying for training.

X_{16} - X_{20} See tables 16 through 20 in Appendix B.

X_{21} Reasons for terminating training can be found in Table Number 21 in Appendix B.

X_{22} 84% of the students received regular or youth allowances and 63% received subsistence or transportation allowances.

2. Descriptive Findings Concerning the In-School Instructor Ratings of Attitudes and Achievements.

Discussed very briefly below is a summary of the ratings which the instructors made on each of the variables included in the in-school instructor ratings of attitudes and achievement. The discussion is based upon the composite of all of the instructor ratings for all groups.

The instructors of the MDTA training programs in the total sample indicated that of the 192 students rated:

Z_1 79% of the students did the work required of them willingly while 21% required some prodding.

Z_2 83% of the students had reasonable work standards during training while 17% were classified as being somewhat careless workers.

Z_3 78% of the students worked reasonably well with other students while 22% worked with others only when necessary.

Z_4 84% of the students accepted constructive criticism while 16% responded negatively to constructive criticism.

Z_5 13% of the students required more than an average amount of discipline.

Z_6 77% of the students put forth reasonable effort during the training program as contrasted with 23% who put forth minimal effort.

Z_7 61% of the students had enough skill when they left the training programs to perform satisfactorily within the occupations, 28% could work at limited aspects of the occupations and 11% had very minimal skills.

Z_8 64% of the students possessed sufficient related technical information when they left the training programs to enable them to perform satisfactorily in the occupations, 22% possessed enough to work at limited aspects of the occupations and 14% possessed very minimal related technical information.

Z_9 62% of the students were confident they would succeed in the occupations when they left the training programs, 27% felt they might and 11% felt they would not.

Z_{10} At the beginning of the training programs 36% of the students were confident they would succeed, 36% thought they might and 28% thought they would not.

Z_{11} At the beginning of the training programs 13% of the students had enough skill to satisfactorily perform within the occupations, 19% had enough skill to work at limited aspects of the occupations and 68% had very minimal skills.

Z_{12} At the beginning of the training program 64% of the students possessed sufficient related technical information to perform satisfactorily within the occupations, 22% possessed enough to work at limited aspects of the occupations and 14% possessed minimal amounts.

Z_{13} About 27% of the students missed more than an average number of days of training.

Z_{14} As one would expect, 50% of the trainees achieved at or above the class average.

Z_{15} 79% of the trainees possessed sufficient basic learning skills (reading, writing and arithmetic) to do at least average work in the classes.

3. Descriptive Data Concerning the Post-Training Employment Data.

The post-training employment status of the trainees was recorded for each trainee 30 days after graduation.

Summaries of these records are shown below in Tables II and III for those persons actually used in the computation of the regression equations only. None of the percentage figures entered in the tables for the group analyzed differ by more than 1.5% from those calculated on the total samples before those students with incomplete data were eliminated.

Table II indicates that 80% of the trainees that started training completed. Of the trainees who started the technician programs 22% dropped out of training before graduation as did 7% of the sales and clerical group trainees and 31% of the skilled group trainees. Table III indicates that 59% of the trainees who graduated from the sales and clerical programs were unemployed 30 days after graduation as contrasted with 3% of the technicians and 6% of the skilled group. Table III also indicates that most graduates of technician programs obtain employment in occupations related to training, about an equal number of graduates of skilled programs are employed in unrelated and related occupations and most graduates of sales and clerical programs become unemployed.

Table II

Post-training Employment Status of Trainees
Including Drop-outs

	Employed in Related Occup.	Employed in Unrelated Occup.	Unemployed	Dropped Before Comp. Training
N = 45 Technician	67%	9%	2%	22%
N = 45 Sales & Clerical	33%	4%	56%	7%
N = 48 Skilled	31%	34%	4%	31%
N = 138 Total Group	44%	16%	20%	20%

Table III

Post-training Employment Status
of Graduates

	Employed in Related Occup.	Employed in Unrelated Occup.	Unemployed
N = 35 Technician	86%	11%	3%
N = 42 Sales & Clerical	36%	5%	59%
N = 33 Skilled	45%	49%	6%
N = 110 Total Group	56%	20%	24%

In an attempt to better understand why 59% of those who graduate from the sales and clerical curricula were unemployed, informal conversations were held with a number of employment service personnel. They indicated that it appears that some of the people enrolling in sales and clerical programs do not do so to increase their employment potential. One hypothesized reason for their participating in the programs is to take advantage of the allowances paid to trainees. Another possible reason is that most of the persons in the sales and clerical group were married women. Being married, their mobility to seek employment may have been reduced because their husbands worked in a geographic area in which there was a small demand for clerical assistance. These reasons may explain why few persons drop out of the sales and clerical programs, yet 59% are unemployed 30 days after graduation. On the other hand, graduates of the technician and skilled programs do appear to be interested in employment. A fairly large number drop out of these programs but the large majority of the graduates become employed.

B. Inferential Findings

The inferential findings will be discussed around each of the two major objectives of the study as stated in section II of this report.

1. Objective A.

To determine which combination of personal information and General Aptitude Test Battery Scores most efficiently predicts whether a trainee will:

(a) drop out of training

(b) complete training and become unemployed

(c) complete training and become employed in an occupation unrelated to training

(d) complete training and become employed in an occupation related to training

and to determine the relationships among those predictors.

Equations were developed using step-wise regression to predict the success criterion from the personal and training related data for each of the samples separately. In each case the "most efficient equation" consisted of seven independent variables. The most efficient equations were determined by examining the relative reductions in the multiple correlation coefficient as each variable was dropped from the equation. As one initially begins to drop variables from an equation, the loss of each variable reduces the multiple regression correlation coefficient by a relatively standard amount.

However, eventually one will find that dropping an additional variable will greatly reduce the coefficient. The "most efficient equations" used in this study include all variables that would produce a disproportionate reduction in the coefficient if they were eliminated, indicating that they, in fact, do contribute substantially to predicting the criterion. The ability of each of the three equations to predict is shown in Table IV.

Table IV

Summary of Multiple Regression Coefficients and Amount of Variance Accounted for by the Specific Equations Developed to Predict Success from Personal and Training Related Data*

Technician	Sales and Clerical	Skilled
$R = .69$	$R = .50$	$R = .69$
$R^2 = .47$	$R^2 = .25$	$R^2 = .47$
$N = 45$	$N = 45$	$N = 48$

*All correlation coefficients significant at .01 level.

In each case, the equation developed to predict the criterion yielded a multiple regression coefficient significant above the .01 level. More importantly, the equation developed for the technician group accounted for 47% of the variance in success between the individuals in the technician group. The equation developed for the sales and clerical group accounted for 25% of the variance and the equation developed for the skilled group accounted for 47% of the variance in the differences in success between individuals in their respective groups. An attempt was also made to develop one composite or common equation that would be capable of predicting well in each of the samples. However, each of the samples was so different that no one equation could be developed that would predict the criterion for each sample near as well as the specific equation developed for each sample.

The seven characteristics which provide the most efficient prediction of the criterion for each sample are presented in Table V. They are presented in order of the amount of variance accounted for by each.

Table V

Rank Order of Personal and Training Related Characteristics having the Most Predictive Efficiency in Order of the Amount of Variance Accounted for by Each

Technical	Sales and Clerical	Skilled
Employment status before training*	Mobility	Primary wage earner*
Verbal aptitude*	Number of dependents	Prior military status*
Marital status	Numerical aptitude	Clerical perception
Primary occupation*	Age	Months of related employment*
Type of work desired when applying*	Employment status before training	Numerical aptitude**
Spatial aptitude*	Primary wage earner	Months of unrelated employment
Handicapped	Number of years of education	Number of years of education**

*Variable has a significant zero-order correlation with the criterion at the .05 level.

**Significant at .10 level.

The beta weights for each of the variables have not been reported. The reason for not reporting them is that the writer does not feel that this study was sufficiently sensitive to imply that there are precise differences between the variables in their ability to predict the criterion. The number of subjects per sample in relation to the number of independent variables used in developing the equations was very small. For this reason the variables are listed in rank order only. The rank orders allow the reader to determine the relative importance of each variable in the equations developed without implying precise differences among them.

Discussed below is the nature of the relationship between each of those variables contained in the technician equation and the criterion variable that had significant zero-order correlations with the criterion above the .05 level. The same was also done for the sales and clerical and skilled equations.

Technician Sample Equation

(1) Employment status before training -- re-entrants to the labor force and the unemployed seem to be more successful than the underemployed in terms of becoming employed in the occupation trained for.

(2) Verbal aptitude -- the higher the GATB verbal aptitude score the more successful the trainee was.

(3) Primary occupation -- students who indicated their primary occupations before training were related to training were less successful than those who indicated their primary occupation was unrelated to training.

(4) Type of work desired when applying -- students undertaking training in an occupation they wished to enter upon applying for training were more successful than those who undertook training in an occupation they did not indicate they wished to enter.

(5) Spatial aptitude -- the higher the GATB spatial aptitude the more successful the trainee was.

Sales and Clerical Sample Equation

None of the seven variables in the final equation developed for the sales and clerical sample had a significant zero-order correlation with the criterion.

Skilled Sample Equation

(1) Primary wage earner -- primary wage earners were less successful than persons who were not primary wage earners.

(2) Prior military status -- people with military experience were less successful than those without military experience.

(3) Months of related work experience -- people with more related work experience are more successful.

2. Objective B.

To determine which combination of teacher ratings of attitudes and achievement most efficiently predicts whether a trainee will:

(a) drop out of training

(b) complete training and become unemployed

(c) complete training and become employed in an occupation unrelated to training or

(d) complete training and become employed in an occupation related to training

and to determine the relationships among those predictors.

Equations were also developed using step-wise regression to predict the success criterion from the in-school instructor ratings of attitudes and achievement for each of the three samples separately. An attempt was also made to develop one composite or common equation that would be capable of predicting well for all samples. The ability of each of the specific equations as well as the common equation to predict the criterion is shown in Table VI.

Table VI

Summary of Multiple Regression Coefficients and Amount of Variance Accounted for by Specific Equations and One Common Equation Developed to Predict the Criterion from Rating Data*

	Technician	Sales and Clerical	Skilled
Specific	$R = .87$ $R^2 = .76$ $N = 45$	$R = .51$ $R^2 = .26$ $N = 45$	$R = .81$ $R^2 = .66$ $N = 48$
Common	$R = .87$ $R^2 = .76$ $N = 45$	$R = .42$ $R^2 = .18$ $N = 45$	$R = .80$ $R^2 = .64$ $N = 48$

*All correlation coefficients significant at .01 level.

In each case the multiple correlation coefficient was significant at the .01 level. The specific equations predicted the following amount of criterion variance for each of the samples: 76% for the technician group, 26% for the sales and clerical group and 66% for the skilled group. The common equation developed by purposively constructing one equation representing the "best" seven predictors from all three specific equations predicated almost as well as the specific equations for the technician and skilled groups. The common equation did not predict as well as the specific equation for the sales and clerical group.

Table VII summarizes the rank order of the ratings having the most predictive efficiency in order of the amount of criterion variance accounted for by each for each specific sample equation. It also summarizes those ratings entering into the common equation without implying any order among these variables.

Table VII

Rank Order of Ratings Having the Most Predictive Efficiency in Order of Amount of Variance Accounted for by Each for Each Specific Sample and the Most Efficient Common List of Ratings

Specific			Common***
Technical	Sales and Clerical	Skilled	
Technical info. when left	Effort	Discipline	Initiative and Ambition
Initiative and Ambition**	Technical info. when entered	Achievement compared to class	Discipline
Confidence when left*	Achievement compared to class	Skill when left*	Effort
Effort*	Discipline	Confidence when entered**	Skill when left
Discipline*	Skill when entered	Technical info. when left	Technical info. when left
Attendance*	Response to criticism	Initiative and Ambition*	Confidence when left
Achievement compared to class*	Skill when left	Confidence when left*	Achievement compared to rest of class

*Variable has a significant zero-order correlation with the criterion at the .05 level.

**Significant at the .10 level.

***No order is implied in the listing of the ratings making up the common equation because the order changes from sample to sample.

Each of the variables indicated in Table VII as having a significant zero-order correlation with the criterion had a positive relationship with the criterion. In other words, increases in any of these variables correlated significantly with increases in success.

V. Summary and Conclusions

A. Descriptive information summary and conclusions

1. Summary and conclusions based upon the personal and training related characteristics descriptive findings.

The descriptive personal and training related characteristics indicated that 69% of the trainees had previously worked primarily in an occupation related to the training program they undertook. An actual review of each of their employment records indicated that 91% had not had any directly related work experience. This discrepancy is probably due to the

different methods used in obtaining the information concerning the trainees prior work record. The trainees themselves indicated whether or not they had worked primarily in a related occupation and the investigator judged whether they had related work experience after reviewing their work history.

An overall picture of an "average" trainee in the programs sample based upon the personal and training related characteristics might be as follows. The trainee was a male between 22 and 34 years of age who had not taken part in military service. He was single or divorced, with himself as the only dependent. He was not handicapped. He was a high school graduate from a general education curriculum with no formal training beyond high school. When he entered the training program he was unemployed, willing to seek employment out of the geographic area and had at least one year of work experience unrelated to the training program he entered. He possessed average or slightly above average intelligence, verbal aptitude, numerical aptitude, spatial aptitude and clerical perception as measured by the GATB. (The other GATB aptitudes were not included in the analyses.) He was given the opportunity to take part in a training program he wished to enter, was granted regular or youth allowances and subsistence or transportation allowances and complete the program. If he dropped out it was for personal reasons.

2. Summary and conclusions based upon the in-school instructor evaluation of attitudes and achievement descriptive findings.

   Based upon the ratio of students who were rated favorably on the measures of attitude and achievement as compared with those who were rated unfavorably, the majority of the MDTA trainees in the sample performed satisfactorily during training in terms of attitudes and skill development. For many of the trainees the training brought about marked increases in their confidence that they would succeed on the job. 62% of the trainees were confident they would succeed after training as compared with 36% of the trainees before training. A similar increase occurred in terms of skill. Prior to training 13% of the students were judged to have enough skill to satisfactorily perform in the occupation as compared with 61% when they completed training. Evidently trainees entering these programs possessed sufficient technical information prior to entering training or the raters did not adequately understand the term technical information because an equal number of trainees were judged to possess sufficient technical information to perform satisfactorily in the occupation prior to training as after training. Other interesting findings were that 79% of the trainees were judged to possess sufficient amounts of basic learning skills to do at least average work in the class, and that 80% of the total groups that started the training programs completed them.

An overall summary of all of the in-school instructor ratings of attitudes and achievement is given below as a description of an "average" individual that took part in the training programs sampled. The average student that took part in the training programs sampled was willing to do the required work in cooperation with other students. His work standards were reasonable and he responded positively to constructive criticism. Throughout the training program he gained in employment confidence and skill development. He attended classes regularly and did not require much discipline. He graduated from the program.

B. Summary of Inferential Findings

1. Summary and conclusions based upon personal and training related data inferential findings.

A multiple regression equation was developed to predict the success criterion for each sample. Each of the three equations predicted the criterion above the .01 level of significance for their respective groups. No one equation was developed that predicted well in all of the three groups.

These findings tend to indicate that it may be possible to develop efficient MDTA trainee selection criteria with empirical predictive validity from data gathering instruments which the employment service is now using. It must be noted, however, that these criteria are not simple criteria. None of the variables used in developing the equations had a zero-order correlation with the criterion that was near as large as the multiple correlation coefficient based upon the correlation of a predicted value (derived from a composite of a number of variables) and the criterion for each of the samples. The largest zero-order correlation of any of the personal and training related variables with the criterion for each group was: technician .44, sales and clerical .21, and skilled .35. These can be compared with the multiple correlation coefficients found in Table IV. In other words, one can not use just one variable as an adequate predictor of success in MDTA training. One must develop equations which combine the effects of a number of variables for prediction.

The findings also indicate that different selection criteria are necessary for placing trainees in different types of occupational training programs. No one equation was developed that could predict success well in each of the types of training programs.

2. Summary and conclusions based upon the in-school instructor ratings of attitudes and achievement.

As in the case of the personal and training related data, a combination of ratings predicted the criterion above the .01

level of significance for each sample. Also, the equations showed that a combination of variables predicted the criterion better in each sample than any one variable, as was true for the personal and training related data.

In the case of the rating data it does appear feasible to develop one equation capable of predicting well for both the technician and skilled groups. The same equation does not do very well for the sales and clerical group (see Table VI). It appears that the sales and clerical group is different than the technician and skilled groups. As indicated earlier, this difference may be due to some of the persons in the sales and clerical group not wanting to become employed, their lacking mobility, or it may be due to the fact that the occupation they are training for requires different attitude and achievement patterns than the technician level or skilled level occupations.

The nature of the variables making up the equations is interesting. The rating variables which best predict success for the technician and skilled groups seem to be classified into two categories: skill and technical information when the trainee left the program and attitudes relating to motivation during the program. The rating variables which predict best for the sales and clerical group seem to fall into two categories also: skill and technical information when the trainee entered the program and attitudes relating to motivation during the program. In other words, one difference which seems to exist between the sales and clerical group and the technician and skilled groups is that success in the sales and clerical group has a higher relationship with the skill and technical information the students possessed when they entered the program while in the technician and skilled groups success is more related to what the trainees possessed when they left training.

The variables entering into all three of the specific equations can be classified into achievement and attitudes. For years persons involved at different levels of vocational education have hypothesized that the possession of skill alone does not insure employability. Other groups have argued that you need primarily good attitudes or primarily good skill to be employed. Each of the three specific equations developed indicate that both good skill and attitudes are related to successful employment. Each is contributing something to the possibility of successful employment that the other is not.

VI. Implications

The implications of the study's conclusions are that the MDTA programs in Minnesota seem to be providing training that leads to employment for the majority of the persons undertaking training. The trainees take the training seriously and perform well during training.

Selection practices might be improved to reduce the relatively large number of drop-outs from the technician and skilled level programs and to reduce the number of people who remain unemployed after graduating from the sales and clerical programs. The selection practices might be improved by developing more appropriate weighted combinations of variables to be used as selection criteria for the programs by investigating the relationships which exist between variables on which the employment service is currently gathering data and employment success. The findings of this study imply that such improvement is possible. There seem to be some systematic differences between persons who succeed and those who do not, otherwise the multiple correlation coefficients would not have been as large as they were.

The guidance implications of such predictive information is evident. If employment counselors were aware of those personal characteristics which tend to lead to success in specific occupations they could more efficiently counsel persons into training programs in which they could succeed. The concept of developing each individual to his greatest potential would be upheld. Training potential could be evaluated on the basis of empirically proven criteria. People could be counseled by occupational counselors into training programs and occupations in which they could realistically succeed. Such counseling would not only develop individuals more realistically but make training programs more efficient. There is little point in placing persons into training programs in which they have little chance of succeeding.

The conclusions of this study also imply that one must concentrate on the development of the proper work related attitudes during training. The evidence indicated that neither attitudes nor skill can predict employment success as well as attitudes and skill. This conclusion might imply that more emphasis should be placed on attitude building during training. Vehicles for attitude building might become a conscious part of training rather than hoping that appropriate attitude building is a necessary by-product of training.

VII. Further Research Possibilities

1. Conduct a similar study with larger samples to validate the findings.

2. Conduct research to identify methods of attitude building during training.

MDTA

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APPENDIX A

RATING SCALE
FOR MDTA STUDENTS

Name of Instructor _____

Name of Student _____

Program he was enrolled in _____

School _____

A. General Questions and Directions:

1. Did the student appear for training ☐ Yes ☐ No
(If he did appear for training continue with the questionnaire, if he did not STOP.)

2. Did the student remain in the program long enough for you to form an opinion about his attitudes and abilities? ☐ Yes ☐ No
If he did not remain in the program long enough for you to adequately judge each of the factors below STOP.)
If he remained in the program long enough for you to adequately judge each of the factors below, RATE EACH INDIVIDUAL, ON EACH FACTOR REGARDLESS IF HE COMPLETED THE ENTIRE PROGRAM OR NOT.)

B. Student's Attitude

	1	2	3	4	5
1. Did he show initiative and ambition?	Required prodding; shirked his responsibilities		Did the required work		Found things to do without supervision
2. Was he quality conscious? (this refers to his standards, not his attainments).	Careless worker		Had reasonable standards		Had high standards
3. Did he cooperate with other students?	Worked with others when necessary		Worked reasonably well with others		Went out of his way to help others
4. How did he respond to constructive criticism?	Responded negatively to constructive criticism		Accepted constructive criticism		Sought constructive criticism

5. How was his attendance?	1	2	3	4	5
	Missed more days then most of the students		Missed about as many days as the typical student		Missed very few days
6. Was he a discipline problem?	1	2	3	4	5
	Required frequent discipline		Required average amount of discipline		Self-disciplined
7. Did he feel he would succeed in the occupation at the beginning of the program?	1	2	3	4	5
	He did not feel he would succeed		He felt he might succeed		He was confident he would succeed
8. Did he feel he would succeed in the occupation when he left the program?	1	2	3	4	5
	He did not feel he would succeed		He felt he might succeed		He was confident he would succeed

C. Ability Within the Occupation

1. How much skill did he have in the occupation when he entered the program?	1	2	3	4	5
	Very minimal skills		Enough skills to work at limited aspects of the occupation		Was skilled enough to perform satisfactorily within the occupation
2. Did he possess sufficient technical information to adequately perform in the occupation when he entered the program?	1	2	3	4	5
	Possessed minimal or no related technical information		Possessed enough related technical information to work at limited aspects of the trade		Possessed sufficient related information to enable him to perform satisfactorily in the trade
3. How much effort did he put forth?	1	2	3	4	5
	Minimal effort		Reasonable effort		Maximal effort
4. How much skill did he have in the occupation when he left the program?	1	2	3	4	5
	Very minimal or no skills		Enough skills to work at limited aspects of the occupation		Was skilled enough to perform satisfactorily within the occupation

	1	2	3	4	5
5. Did he possess sufficient related technical information to adequately perform in the occupation <u>when he left the program</u>?	Possessed minimal or no related technical information		Possessed enough related technical information to work at limited aspects of the occupation		Possessed sufficient related technical information to enable him to perform satisfactorily in the occupation

D. <u>Overall Judgements</u>

<u>DIRECTIONS</u>: Remember that in responding to the items below you are to respond based upon your knowledge of the individual when he <u>left</u> the program regardless if he completed the program or not.

	1	2	3	4	5
1. What was his achievement compared to the rest of the class?	Achieved far below the class average		Achieved about average		Achieved far above the class average

2. Compared to the rest of the class was the student prepared for training in terms of his reading, writing and arithmetic skills? ☐ Yes ☐ No

APPENDIX B

Contained in Appendix B is a summary of descriptive information for each of the personal and training related characteristic variables by sample as well as for the total composite over all samples. The percentage figures are based on a total composite group of 192 trainees.

Individual sample sizes were as follows: 65 technicians, 63 sales and clerical and 64 skilled. (See Table I for a more precise breakdown of each sample.)

Age (Var. X_1)

	Nat'l.	Minn.	Overall	Technical	Sales-Clerical	Skilled
Under 22	34%	37%	29%	31%	23%	34%
22-34	37%		51%	53%	47%	56%
35-44	17%	of 51%	10%	10%	10%	8%
45 or over	12%	12%	10%	6%	20%	2%

Sex (Var. X_2)

	Nat'l.	Minn.	Overall	Technical	Sales-Clerical	Skilled
Male	57%	63%	59%	29%	18%	100%
Female	43%	37%	41%	71%	82%	0%

Handicapped (Var. X_3)

	Overall	Technical	Sales-Clerical	Skilled
Handicapped	16%	15%	20%	12%
Not-handicapped	84%	85%	80%	88%

Prior Military Service (Var. X_4)

	Overall	Technical	Sales-Clerical	Skilled
Yes	10%	16%	4%	12%
No	90%	84%	96%	88%

Marital Status (Var. X_5)

	Overall	Technical	Sales-Clerical	Skilled
Single-Divorced	60%	53%	67%	56%
Married-Separated	40%	47%	33%	44%

Primary Wage Earner (Var. X_6)

	Overall	Technical	Sales-Clerical	Skilled
Yes	79%	68%	83%	85%
No	21%	32%	17%	15%

Number of Dependents (Var. X_7)

	Overall	Technical	Sales-Clerical	Skilled
5	9%	11%	7%	8%
4	8%	8%	8%	7%
3	11%	7%	12%	15%
2	12%	11%	15%	8%
1	40%	31%	41%	47%
0	20%	32%	17%	15%

Primary Occupation Prior to Training (Var. X_8)

	Overall	Technical	Sales-Clerical	Skilled
Related to training	69%	82%	55%	74%
Unrelated to training	31%	18%	45%	26%

Willingness to move out of area after training - Mobility (Var. X_9)

	Overall	Technical	Sales-Clerical	Skilled
Mobile	67%	66%	55%	85%
Not Mobile	33%	34%	45%	15%

Employment Status of Trainees When Applying for Training (Var. X_{10})

	Overall	Technical	Sales-Clerical	Skilled
Underemployed	29%	35%	29%	25%
Unemployed	69%	63%	68%	75%
Re-entrant to Labor force	2%	2%	3%	0

Education (Var. X_{11})

	Nat'l.	Minn.	Overall	Technical	Sales-Clerical	Skilled
Under 8 yrs.	6%		2%	0%	0%	7%
8 Yrs.	10%	39%	4%	2%	2%	8%
9-11 yrs.	36%		21%	8%	22%	33%
12 yrs.	41%	52%	63%	72%	67%	49%
Over 12 yrs.	7%	9%	10%	18%	9%	3%

Type of High School Curriculum Taken by Trainees (Var. X_{12})

	Overall	Technical	Sales-Clerical	Skilled
General education	88%	73%	92%	97%
College preparation	10%	21%	8%	3%
Voc. unrelated	2%	6%	0%	0%
Voc. related	0%	0%	0%	0%

Months of Training Beyond High School (Var. X_{13})

Months	Overall	Technical	Sales-Clerical	Skilled
0-6	88%	89%	86%	90%
7-12	7%	10%	8%	5%
13-24	3%	0%	5%	5%
25-36	1%	0%	1%	0%
37-48	1%	1%	0%	0%

Type of Additional Training Beyond High School (Var. X_{13})
and its Relationship to Training

	Overall	Technical	Sales-Clerical	Skilled
College-related	4%	7%	0%	8%
College-unrelated	2%	0%	50%	8%
Voc.-related	27%	13%	50%	8%
Voc.-unrelated	67%	80%	0%	76%

Months of Employment Related to Training (Var. X_{14})

	Overall	Technical	Sales-Clerical	Skilled
0	91%	98%	92%	84%
1-6	1%	0%	1%	2%
7-12	2%	2%	1%	5%
13-24	2%	0%	4%	1%
25-36	3%	0%	2%	7%
37-48	1%	0%	0%	1%

Months of Employment Unrelated to Training (Var. X_{14})

	Overall	Technical	Sales-Clerical	Skilled
0	9%	10%	10%	7%
1-6	11%	8%	8%	17%
7-12	15%	11%	18%	13%
13-24	14%	11%	15%	17%
25-36	11%	8%	10%	13%
37-48	12%	16%	11%	10%
49-60	6%	6%	6%	5%
61-72	4%	5%	4%	3%
73-84	3%	7%	1%	3%
85-96	15%	18%	17%	12%

Type of Work Desired by Trainees When Applying for Training (Var. X_{15})

	Overall	Technical	Sales-Clerical	Skilled
Related to training	81%	79%	88%	74%
Unrelated to training	19%	21%	12%	26%

GATB-G (Var. X_{16})

	Overall	Technician	Sales-Clerical	Skilled
150-170	1%	2%	0%	0%
130-149	3%	5%	1%	3%
110-129	40%	68%	28%	28%
90-109	45%	25%	57%	50%
70-89	10%	0%	14%	16%
50-69	1%	0%	0%	3%

GATB-V (Var. X_{17})

	Overall	Technician	Sales-Clerical	Skilled
130-149	4%	7%	4%	0%
110-129	27%	43%	25%	14%
90-109	54%	46%	59%	55%
70-89	14%	4%	12%	30%
50-69	1%	0%	0%	1%

GATB-N (Var. X_{18})

	Overall	Technician	Sales-Clerical	Skilled
130-149	3%	6%	0%	3%
110-129	34%	52%	25%	29%
90-109	52%	40%	65%	47%
70-89	8%	2%	9%	14%
50-69	3%	0%	1%	7%

GATB-S (Var. X_{19})

	Overall	Technician	Sales-Clerical	Skilled
150-170	1%	2%	0%	2%
130-149	12%	22%	8%	8%
110-129	43%	51%	36%	43%
90-109	33%	25%	39%	33%
70-89	10%	0%	17%	12%
50-69	1%	0%	0%	2%

GATB-Q (Var. X_{20})

	Overall	Technician	Sales-Clerical	Skilled
150-170	3%	2%	5%	2%
130-149	9%	16%	9%	4%
110-129	35%	43%	44%	16%
90-109	48%	39%	36%	71%
70-89	4%	0%	6%	5%
50-69	1%	0%	0%	2%

Reasons for Termination of Training After Selection (Var. X_{21})

	Overall	Technician	Sales-Clerical	Skilled
Achieved training obj.*	65%	63%	71%	59%
Obtained employment	2%	5%	1%	2%
Illness	2%	2%	4%	0%
Insufficient funds	3%	3%	1%	3%
Personal problems	21%	19%	15%	31%
Undertook full-time training	1%	3%	0%	2%
Failed to enroll	6%	5%	8%	3%

*need not have graduated -- may have developed sufficient competency to be employed prior to graduation

Regular or Youth Training Allowances (Var. X_{22})

	Overall	Technician	Sales-Clerical	Skilled
Yes	84%	79%	80%	93%
No	16%	21%	20%	7%

Subsistence or Transportation Allowance (Var. X_{22})

	Overall	Technician	Sales-Clerical	Skilled
Yes	63%	56%	66%	66%
No	37%	44%	34%	34%

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